FERC-0059

PLANNING STATUS REPORT

WATER RESOURCES APPRAISALS
FOR HYDROELECTRIC LICENSING

BRAZOS RIVER BASIN

TEXAS—NEW MEXICO

NEWARK PUBLIC LIBRARY

OCT 22 1980

U. S. GOVT. PUBS.
DEPOSITORY 376

FEDERAL ENERGY REGULATORY COMMISSION
OFFICE OF ELECTRIC POWER REGULATION
FORT WORTH REGIONAL OFFICE

Revised 1980

E2.12:

PLANNING STATUS REPORT

WATER RESOURCES APPRAISALS FOR HYDROELECTRIC LICENSING

This is one of a series of revised Planning Status Reports for major river basins in the United States. The original reports, which were prepared several years ago, are being revised as part of a program of Water Resources Appraisals for Hydroelectric Licensing. The revised reports provide updated information on water resources for use by the Federal Energy Regulatory Commission and its staff when considering hydroelectric licensing and other work. The reports present data on water resource developments, existing and potential, and on water use by existing and projected steam-electric generating facilities. The reports also summarize past and current planning studies. The information presented in these reports was abstracted from available sources and involved no new analyses. The report is a staff effort which was not prepared for adoption or approval by the Commission, and does not commit or prejudge later Commission action. Although several persons contributed to the preparation, the primary author was Paul McKee in the Fort Worth Regional Office.

FEDERAL ENERGY REGULATORY COMMISSION

OFFICE OF ELECTRIC POWER REGULATION

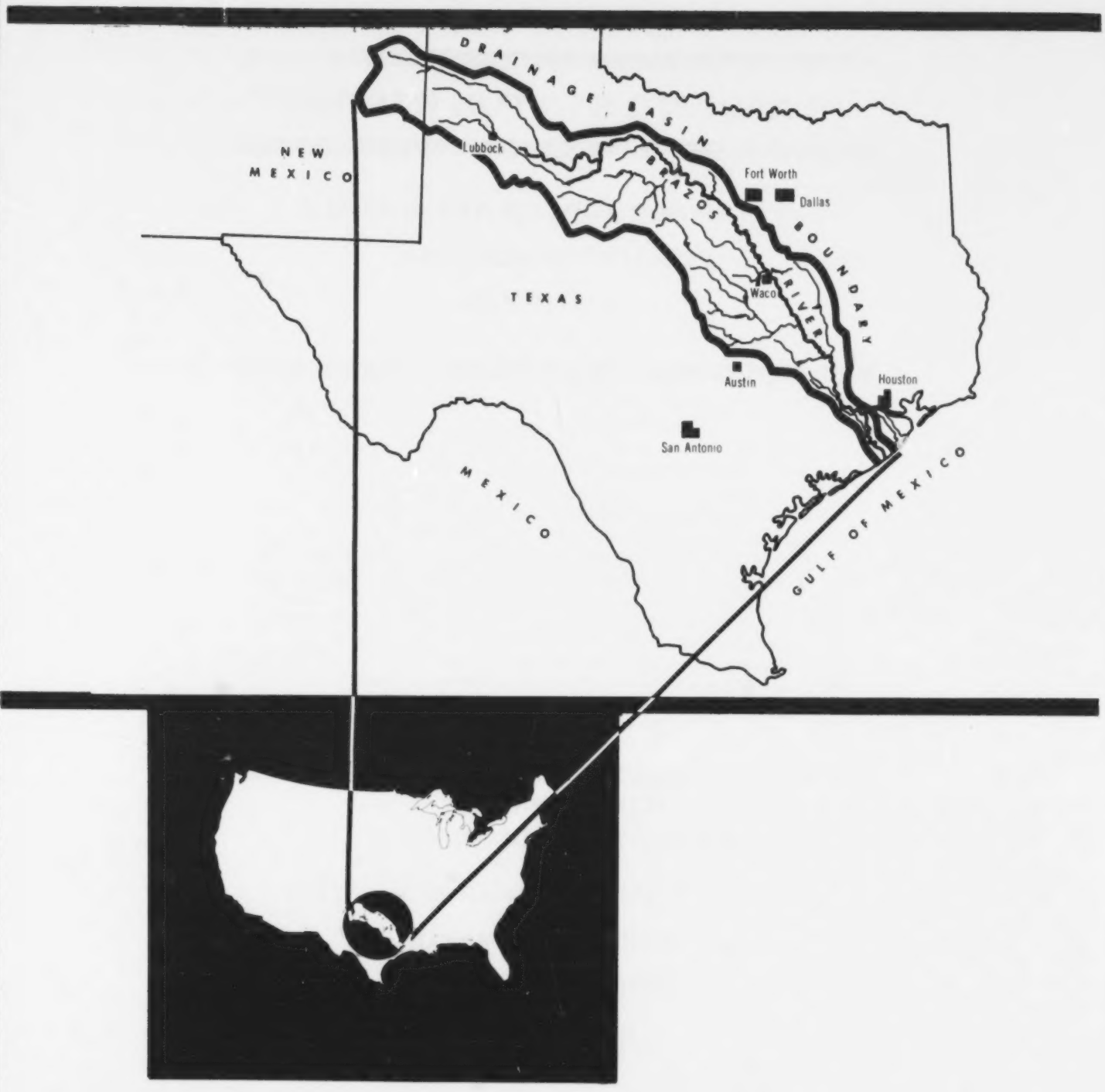
FORT WORTH REGIONAL OFFICE

ORIGINALLY ISSUED 1964

REVISED 1980

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402

THE BRAZOS RIVER BASIN



DESCRIPTION OF THE BASIN

The Brazos River basin heads in eastern New Mexico about 25 miles northwest of the city of Clovis and extends in a southeasterly direction diagonally across Texas to the Gulf of Mexico with an associated area that includes the coastal drainage north and east of the Brazos River to Galveston Bay as shown on figure 2. The basin and associated area have an overall length of about 640 miles and a maximum width of 120 miles. The total area includes 46,022 square miles of which 1,800 square miles are in New Mexico and 44,222 square miles are in Texas. Approximately 9,240 square miles of the area, located in the northwest portion of the watershed, are considered as noncontributing to streamflow. The associated area, which drains into the Gulf of Mexico, comprises 1,382 square miles. The main tributaries of the Brazos River proceeding from the headwaters are the Double Mountain Fork, Salt Fork, Clear Fork, Paluxy River, Aquilla Creek, North Bosque River, Leon River, Little River, Yegua Creek, and the Navasota River.

The basin has three distinct areas - the Great Plains, the Central Lowland, and the Coastal Plain. Two separate segments are occupied by the Great Plains area, the upper portion extending from the head of the basin to the Cap Rock Escarpment near Post, Texas, and the lower portion extending from near Mineral Wells to Waco. The Central Lowland area lies between the two Great Plains areas, and the Coastal Plain area extends from near Waco to the Gulf of Mexico. Elevations vary in the upper portion of the Great Plains from 4,500 to 3,000 feet, and in the lower portion's elevations range from 1,800 to 500 feet. The Central Lowland elevations range from 3,000 to about 1,800 feet, and the Coastal Plain elevations vary from about 500 feet inland to sea level at the Gulf of Mexico.

On the northeast and east, the basin is bounded by the Trinity and San Jacinto River basins, respectively. It is bounded on the north by the Upper Red River basin and on the south and southwest by the Colorado River basin.

Mean annual temperatures of the basin vary from about 58 degrees Fahrenheit in the extreme headwater area to about 70 degrees Fahrenheit near the Gulf of Mexico. Normally, the winters are short and mild, but subzero temperatures have been recorded in the upper portion of the watershed during the winter months.

Average annual precipitation in the basin varies from 17 inches in the extreme headwater area to 46 inches near the Gulf of Mexico with about 75 percent occurring during the growing season. Winds in the upper Great Plains area prevail from west and south while in the other areas of the basin winds are mostly southerly. Average annual net lake surface evaporation varies from about 15 inches near the coast to about 58 inches in the headwaters. The runoff over the basin area varies from a trace in the extreme headwaters to about 10 inches per year near the river's mouth.

The 1970 population of the basin was slightly in excess of 1,532,000 of which about 1,148,000, or 75 percent, lived in incorporated cities or towns. Approximately 3 percent, or 51,000 inhabitants of the basin, live in New Mexico. Major cities in the basin and the associated area having over 40,000 population in 1970 include Lubbock - 149,101; Waco - 95,326; Abilene - 89,653; and Galveston - 61,809. Four other cities in the basin have populations in excess of 30,000.

Agriculture is the principal industry in the area with farms and ranches comprising 24,872,000 acres, or 84 percent of the basin area. Agriculture in the basin is diversified in nature and major crops are cotton, grain, sorghum, rice, peanuts,

DESCRIPTION OF THE BASIN

forage crops, hay, pecans, and many types of vegetables. Dairying, livestock and poultry raising, and the production of wool and mohair are also other important agricultural industries.

There are 38 oil-producing counties lying wholly or partially within the basin. Production and processing of crude oil, including petro-chemicals, comprise the major industry. Brick manufacturing is a significant, though secondary non-agricultural industry.

Mineral deposits within the basin consist of petroleum, natural gas, gravel, stone, sand, bromide, magnesium, chloride, salt, lime, sulphur, graphite, clays, gypsum, and shell in various amounts and locations.

The economic importance of the basin is enhanced by its proximity to Houston, Dallas, and Fort Worth -- three of the large commercial centers of Texas.

EXISTING WATER RESOURCE DEVELOPMENTS

Table 1 lists 38 reservoirs in the basin, which are existing or under construction and have storage capacities in excess of 5,000 acre-feet. Nine of these are Federal projects. Two of the existing reservoirs support hydroelectric facilities. The Possum Kingdom plant, owned and operated by the Brazos River Authority, FERC Project No. 1490, has an installed capacity of 22,500 kilowatts with provisions for installation of a third unit. The Whitney project, with a multi-purpose reservoir, is operated by the U.S. Corps of Engineers and has an installed hydroelectric capacity of 30,000 kilowatts.

All of the Federal and one of the non-Federal reservoirs have space allocated for storage of floodwaters. The conservation storage capacity is available for municipal and industrial water supply, agricultural irrigation, and as cooling water for steam-electric power generation. Much of the sale and distribution of this storage is under auspices of the Brazos River Authority, either by contract or by ownership.

Construction of flood water-retarding structures by the Soil Conservation Service of the U.S. Department of Agriculture began in 1950, and by January 1976, there were about 1,400 square miles of drainage area behind 242 such structures existing within the basin.

The Gulf Intracoastal Waterway, 12 feet deep at mean low tide, with a bottom width of 125 feet, provides for shallow draft navigation along the coastline of the Brazos River basin and the adjacent associated area. The natural Brazos River channel is blocked by a diversion dam about 7.5 miles above the original river mouth, and all of the river flow is through the diversion channel. The natural river channel lies to the east of the diversion channel and has been developed as a deep-water navigation project serving Freeport and adjacent areas. At Freeport a deep-water harbor serves seagoing vessels.

In 1975, there were 15 steam-electric generating plants with generating capacities of 25 megawatts or greater located in the basin and associated area, as listed in table 2. The total installed capacity was 8,703 megawatts, and the 1975 generation

EXISTING WATER RESOURCE DEVELOPMENTS

Table 1

Storage Reservoirs
Projects Existing or Under Construction
Brazos River Basin

Reservoir	Stream	Project Purpose 1/	Drainage Area (sq mi)	Dead 2/	Storage Capacity (thousands of ac-ft) Conservation	Flood Control	Total
Non-Federal							
White River	White River	WS	172	0.7	37.9	0.0	38.6
Millers Creek	Millers Creek	WS	224	8.5	17.0	0.0	25.5
Lake Sweetwater	Bitterwood & Cottonwood Creeks	WS	104	0.0	11.9	0.0	11.9
Lake Abilene	Elm Creek	WS	110	0.0	9.8	0.0	9.8
Kirby Lake	Cedar Creek	WS	44	0.0	7.6	0.0	7.6
Lake Lytle	Lytle Creek	C	59	3/	6.5	0.0	6.5
Fort Phantom Hill	Big Elm Creek	WS	478	0.0	74.3	0.0	74.3
Lake Stamford	Paint Creek	WS	360	0.4	59.6	0.0	60.0
Lake Cisco	Sandy Creek	WS	26	0.0	25.6	0.0	25.6
Hubbard Creek	Hubbard Creek	WS	1,107	0.0	320.0	0.0	320.0
Lake Daniel	Gonzales Creek	WS	115	0.4	9.6	0.0	10.0
Lake Graham	Flint & Salt Creeks	WS	42	8.7	53.7	0.0	62.4
Possum Kingdom	Brazos River	P,WS	22,550	0.2	724.7	0.0	724.7
Lake Palo Pinto	Palo Pinto Creek	WS	471	1.9	42.2	0.0	44.1
Lake Mineral Wells	Rock Creek	WS	63	0.0	8.4	0.0	8.4
Lake Granbury	Brazos River	P,WS	24,690	15.5	138.0	0.0	153.5
Lake Pat Cleburne	Nolan River	WS	100	0.1	25.4	19.9	45.4
Tradinghouse Creek	Tradinghouse Creek	C	39	0.0	37.8	0.0	37.8
Lake Creek	Manos Creek	C	17	0.3	8.1	0.0	8.4
Leon	Leon River	WS	252	0.9	26.4	0.0	27.3
Lake Alcoa	Sandy Creek	WS	6	3/	14.8	0.0	14.8
Lake Mexia	Navasota River	WS	198	1.0	9.0	0.0	10.0
Limestone Reservoir	Navasota River	C,WS	674	3/	225.4	0.0	225.4
Camp Creek Lake	Camp Creek	WS	40	0.3	8.3	0.0	8.6
Smithers Lake (Lake George)	Dry Creek	C	24	0.0	18.0	0.0	18.0
Eagle-West Manor Lakes	Varners Creek	WS,R	32	0.0	18.0	0.0	18.0
Brazoria	Off Stream	WS	3/	0.7	21.3	0.0	22.0
William Harris	Off Stream	WS	3/	0.9	11.1	0.0	12.0
Buffalo Spring	Double Mountain Fork	WS,R	286	0.3	4.0	0.0	4.3
Total Non-Federal				40.8	1,974.2	19.9	2,034.8
Federal 4/							
Whitney	Brazos River	P,FC	17,656	245.2	381.9	1,372.4	1,999.5
Aquilla	Aquilla Creek	FC,WS	252	25.7	33.6	86.7	146.0
Waco	Bosque River	WS	1,670	69.0	104.1	553.3	726.4
Proctor	Leon River	FC,WS	1,265	32.7	31.4	310.1	374.2
Belton	Leon River	FC,WS	3,560	84.9	372.7	640.0	1,097.6
Stillhouse Hollow	Lampasas River	FC,WS	1,380	34.9	204.9	390.6	630.4
North Fork	N. Fk. San Gabriel River	FC,WS	246	14.0	29.2	87.6	130.8
Granger	San Gabriel River	FC, WS	709	44.6	37.9	162.2	244.2
Somerville	Yegua Creek	FC,WS	1,006	25.9	143.9	337.7	507.5
Total Federal				576.4	1,339.6	3,940.6	5,856.6

1/ P - Power; C - Cooling water requirements; FC - Flood control; WS - Water supply; WQ - Water quality control; R - Recreation; FW - Fish and wildlife.
2/ That storage below invert of lowest reservoir outlet.
3/ Not available.
4/ Does not include floodwater retarding structures constructed by the Soil Conservation Service.

EXISTING WATER RESOURCE DEVELOPMENTS

Table 2

Steam-Electric Generating Plants with
Installed Capacities of 25 MW or Greater

Brazos River Basin and Associated Area - 1975

Plant	Owner 1/	Installed Capacity (MW)	County	Cooling Water Source	Type Cooling 2/
Plant X	SOPS	434	Lamb	Wells	WT
Lubbock No. 2	LUBB	81	Lubbock	City Water	WT
Holly Avenue	LUBB	50	Lubbock	City Water	WT
Jones	SOPS	495	Lubbock	Sewage	WT
Paint Creek	WETU	242	Haskell	Paint Creek	WT
Abilene	WETU	26	Taylor	City Water	WT
Fort Phantom	WETU	146	Jones	Elm Creek	CP
Graham	TEES	635	Young	Salt Creek	CP
Randle W. Miller	BREP	404	Palo Pinto	Palo Pinto Creek	CP
DeCordova	TEPL	799	Hood	Brazos River	CP
Tradinghouse Creek	TEPL	1,380	McLennan	Tradinghouse Creek	CP
Lake Creek	TEPL	316	McLennan	Lake Creek	CP
Bryan	BRYN	125	Brazos	Wells	WT
W.A. Parrish	HOLP	1,255	Fort Bend	Dry Creek	CP
P.H. Robinson	HOLP	2,315	Galveston	Dickinson Bay	OT

1/ SOPS - Southwestern Public Service Company, LUBB - City of Lubbock, WETU - West Texas Utilities Company, TEES - Texas Electric Service Company, BREP - Brazos Electric Power Cooperative, Inc., TEPL - Texas Power & Light Company, BRYN - City of Bryan, HOLP - Houston Lighting & Power Company.

2/ WT - Wet tower; CP - Cooling pond; OT - Once-through.

was 35,357 million kilowatt-hours. Water withdrawn for cooling purposes was estimated to be 1,547 million gallons per day with an estimated consumption rate of 38 million gallons per day.

STATUS OF HYDROELECTRIC LICENSING

The Possum Kingdom (Morris Sheppard) hydroelectric development is operated under a Federal Energy Regulatory Commission License (Project No. 1490). This plant, owned by the Brazos River Authority, has an installed capacity of 22,500 kilowatts with provisions for the installation of a third unit. The dam is located on the Brazos River about 14 miles northwest of Palo Pinto at river mile 687.5. The project, completed in 1941, is a key regulation structure for a series of potential downstream projects. Article 15 of the license, which expires May 25, 1988, provides that the

operation of the project by the licensee shall at all times be subject to the control of the Secretary of Defense under such reasonable rules and regulations as he may prescribe in the interest of navigation, and subject to the control of the Federal Energy Regulatory Commission under such reasonable rules and regulations as it may prescribe for the safety of the dam and for the protection of life, health, and property.

The Brazos Electric Power Cooperative, Inc. (BREP) was issued a Federal Energy Regulatory Commission preliminary permit (FERC Project No. 2733, Village Bend) in February 1975 to study the potential for construction of a pumped-storage powerplant in conjunction with a lower reservoir to be impounded behind a dam at the Inspiration Point site on the Brazos River about 70 miles downstream from the Morris Sheppard Dam. The upper reservoir would be located on Wynn Mountain. The preliminary permit expired in February 1978. However, BREP, through a consulting firm, is giving continuing consideration to a pumped-storage plant consisting of 800,000 kilowatts of reversible capacity supplemented by 12,500 kilowatts of conventional capacity at the Inspiration Point damsite.

There are no non-Federal unlicensed hydroelectric power projects in the basin.

WATER RESOURCES PLANNING

Prior Studies and Reports

Early studies and surveys of the Brazos River were concerned primarily with navigation. A list of reports prepared prior to 1931 is located in appendix 2 of the Corps of Engineers' Report on Preliminary Examination of Brazos River, Texas, published in 1930 as House Document No. 181, 72nd Congress, 1st Session.

Federal projects completed in the basin since 1930 have been studied, designed, and constructed in accordance with acts of and authorization by the Congress of the United States. Studies and construction in progress at this time by the Corps of Engineers are remnants of projects authorized by the Flood Control Act of September 3, 1954, which authorized the basinwide improvement for the Brazos River basin as outlined in House Document No. 535, 81st Congress, 2nd Session, and appropriated $40,000,000 for partial accomplishment of this plan. The Flood Control Acts of 1962 and 1968 authorized a number of projects including South Fork, Navasota, and Millican Reservoirs. Public Laws 86-645, 88-253, 89-42, 90-17, 90-483, 91-282, 92-222, and 93-251 authorized an additional $120,000,000, bringing total authorization to $160,000,000. The plan further provides for modifications of the existing Belton Lake project through future installation of hydroelectric power generating facilities.

The Federal Energy Regulatory Commission (during its existence as the Federal Power Commission) has made cooperative studies and provided comments on the power potential at all the completed projects and potential sites studied in the basin.

The Soil Conservation Service of the U.S. Department of Agriculture began its construction program in the basin in 1950 under authority granted by Public Law 566, as amended.

WATER RESOURCES PLANNING

The U.S. Study Commission - Texas was a joint Federal-State study and a report on its conclusions was published in 1962 as House Document No. 494, 87th Congress, 2nd Session.

The Brazos River Authority (BRA) has made studies of individual sites and of coordination of a group of sites. A plan of development for water conservation, flood control, and power, prepared for BRA by a consultant, was reviewed by the Corps of Engineers and published as Senate Document No. 34, 85th Congress, 1st Session.

In April 1969, the Texas Water Development Board published its Texas Water Plan, the summary of a study to provide for the projected water needs of all areas of Texas, giving full consideration to environmental needs, conservation and efficient water use, economic development and welfare, human rights and needs, social and recreation concerns, climatological variations, financial constraints, water quality, and water rights. A report titled "Texas Coastal Basin," dated September 1977, was based on a cooperative river basin survey by the U.S. Department of Agriculture in cooperation with several State of Texas agencies and the Interagency Council on Natural Resources and the Environment. The purpose was to describe U.S. Department of Agriculture's program opportunities and impacts for use in facilitating the coordinated and orderly conservation, development, utilization, and management of the water and related land resources of the basin through an assessment of the water and related land resources problems, needs, and development potential of that basin. The lower portion of the Brazos River basin and associated area is included in this study.

Current and Future Studies

The Corps of Engineers projects 1982 as the approximate completion date for its current Brazos River study. The Texas Water Development Board's study of water resource development is a continuing assignment. A study by the Brazos River Authority, on a smaller scale, is in the same category. As of January 1976, the Soil Conservation Service had plans for an additional 413 floodwater-retarding structures in the Brazos basin with a combined drainage area of 2,200 square miles.

Should the proposed Village Bend pumped storage project prove feasible, there would likely be renewed interest in similar potentials.

Possum Kingdom project (Morris Sheppard Dam) is operated by the Brazos River Authority (BRA). Some years ago, the BRA made an extensive study of the potential for adding a third unit at Possum Kingdom and developing additional powerplants downstream at the Turkey Creek, Inspiration Point, Hightower, DeCordova Bend, and Bee Mountain sites. However, the BRA did not pursue the plan in its entirety but has since constructed a dam at the DeCordova Bend site. The reservoir, Lake Granbury, provides water supply and recreational values. Should the Village Bend pumped storage project be carried through with a lower reservoir at the Inspiration Point site, the increased elevation of this reservoir would eliminate the Turkey Creek site which is between Possum Kingdom and Inspiration Point. Since the development of the Village Bend project appears likely, Turkey Creek has been omitted from this report. There is still a potential for hydropower at the Hightower, DeCordova Bend, and Bee Mountain sites and for the addition of the third unit at Possum Kingdom.

WATER RESOURCES PLANNING

In a letter of April 23, 1979, to the Federal Energy Regulatory Commission, the U.S. Fish and Wildlife Service (USF&WS) proposed the establishment of minimum flow releases from Morris Sheppard Dam to increase recreation on the Brazos River. In addition, the USF&WS has proposed inclusion of the 120 miles of the Brazos River below the Morris Sheppard Dam in the National Wild and Scenic River System. If these proposed actions are taken, the potential developments at the Hightower and Inspiration Point sites would be eliminated. The feasibility of adding a third turbine-generator at the Morris Sheppard project would also be eliminated.

It appears that the Belton project was designed on the basis that, when sufficient flood control storage capacity became available in the basin, a portion of the flood control storage capacity at Belton could revert to conservation storage capacity and, if feasible, power could be added as a project purpose. With the completion of Granger and North Fork Reservoirs, conditions may be favorable enough to warrant a study of this nature.

POTENTIAL WATER RESOURCE DEVELOPMENTS

Potential Hydroelectric Developments

Potential hydroelectric projects are summarized in table 3.

Table 3

Potential Hydroelectric Projects
Brazos River Basin

Project	River	River Mile	Drainage Area (sq mi)	Gross Head (ft)	Installed Capacity (kW)	Storage Capacity Usable for Power (1,000 ac ft)	Storage Capacity Total
Possum Kingdom	Brazos	687	22,550 1/	126	11.25 2/	432.0	724.7
Wynn Mountain 3/	4/	4/	5/	425	800.0 6/	80.0	80.0
Inspiration Point 7/	Brazos	616	23,213 1/	87	12.5	234.5	422.4
Hightower	Brazos	576	24,393 1/	63	86.2	429.8	520.0
DeCordova Bend	Brazos	542	24,690 1/	79	60.0 8/	138.1	153.5
Bee Mountain	Brazos	483	25,491 1/	91	144.2	320.5	360.0
Belton	Leon	17	3,560	110	19.0 9/	372.7	1,097.6

1/ *9,240 square miles considered to be non-contributing.*
2/ *Added capacity at existing hydroelectric plant.*
3/ *Upper reservoir for Village Bend pumped storage project located on Wynn Mountain.*
4/ *Off stream.*
5/ *Ring dike.*
6/ *Pumped storage capacity.*
7/ *Lower reservoir for Village Bend pumped storage project located at this site.*
8/ *Addition of hydro capacity at existing storage project.*
9/ *Addition of hydro capacity at existing multi-purpose project.*

POTENTIAL WATER RESOURCE DEVELOPMENTS

Potential Storage Reservoirs

Potential storage reservoirs in the Brazos River basin are summarized in table 4.

The 1977 modification of the Texas Water Plan projects proposed developments to the year 2000 and potential developments to the year 2030. The Post, Justiceburg, and Breckenridge sites are noted in these projections.

The Seymour, South Bend, Keechi Creek, South Fork, Millican, and Allens Creek locations were cited in the 1962 report of the U.S. Study Commission-Texas as potential sites for development of water supply reservoirs. South Fork, Navasota, Millican, and Allens Creek Sites are a part of the modified (1977) Texas Water Plan.

The Seymour site has great potential for water storage, but quality of conservation storage is affected by saline water flow. Efforts are being made to alleviate this problem.

South Bend Reservoir was originally proposed for silt retention in the plan of the Brazos River Authority (in the 1950's) for a six-plant hydro system on the Brazos River. The site is adaptable to other storage. Hightower and Bee Mountain sites, which were a part of the plan, are included in table 4 as well as in table 3. The Turkey Creek and Inspiration Point sites, a part of the same plan, would be superseded by the proposed Village Bend pumped storage development and have been omitted from table 4.

The development of flood control and water supply storage on the Navasota River, in the overall plan of improvement for the Brazos River, has been studied for more than 30 years, and during that time, there have been several changes in proposed plans. The plan which is now authorized consists of the construction of two units by the Corps of Engineers. Millican Dam at river mile 24.1 is planned to be the first of a 2-stage development and will be followed by construction of Navasota Dam at river mile 83.4. The Millican project is in the advanced engineering and design phase, but the existence of potentially commercial, near-surface lignite deposits in the reservoir area poses a significant conflict. The Corps of Engineers is currently reassessing this plan of development.

Projected Thermal Generating Capacity and Cooling Needs

Table 5 lists the projected generating capacity and cooling water needs in the Brazos River basin and associated area. These data are based on information compiled for the Water Resource Council's Second National Water Assessment.

Federal Energy Regulatory Commission staff projections indicate that there may be 20 steam-electric generating plants in operation with generating capacities of 25 megawatts or greater located in the basin and associated area by 1985, as shown in table 6. The total installed capacity is estimated to be 16,475 megawatts, with 1985 generation projected at 73,960 million kilowatt-hours. Fresh and saline water withdrawals for cooling purposes are estimated at 111 and 1,242 million gallons per day, respectively. The consumption rates for fresh and saline water are estimated at 74 and 8 million gallons per day, respectively. It appears that 13 plants will use cooling ponds, 7 plants will use cooling towers, and 1 plant will use once-through cooling.

POTENTIAL WATER RESOURCE DEVELOPMENTS

The total estimated generating capacity for the year 2000 is 64,529,000 kilowatts. This includes 3 proposed nuclear plants (23,250,000 kilowatts). Annual generation is estimated to be 274,110 million kilowatt-hours. The cooling water withdrawal would be 1,022 million gallons per day, including 504 million gallons per day of saline water. The consumptive use would total 343 million gallons per day, including 3 million gallons per day of saline water. One plant (4,000,000 kilowatts) is expected to use dry-tower cooling.

Table 4

Potential Storage Reservoirs
Brazos River Basin

Project	Stream	Storage Capacity			
		Sediment Reserve	Conservation	Flood Control	Total
		(thousands of ac-ft)			
Post 1/	Double Mt. Fork	2/	2/	2/	2/
Justiceburg 1/	S. Fk. Dble, Mt. Fk.	2/	2/	2/	2/
Seymour	Brazos River	300.5	700.0	1,035.0	2,035.5
South Bend	Brazos River	250.0	270.0	0.0	520.0
Breckenridge 1/	Clear Fork	2/	2/	2/	2/
Keechi Creek	Keechi Creek	14.1	33.0	0.0	47.1
Hightower	Brazos River	59.2	429.8	31.0	520.0
Bee Mountain	Brazos River	39.5	320.5	0.0	360.0
South Fork 3/	S. Fk. San Gabriel	8.0	28.9	45.7	82.6
Navasota 3/	Navasota River	69.5	1,315.4	550.7	1,935.6
Millican 3/	Navasota River	92.4	680.2	784.8	1,557.4
Allens Creek	Allens Creek	75.0	500.0	0.0	575.0

1/ *Potential future development sites in the Texas Water Plan.*
2/ *Not available.*
3/ *Authorized.*

Table 5

Projected Steam-Electric Requirements
(Fossil and Nuclear)
Brazos River Basin

Year	Capacity (kW)	Generation (million kWh)	Cooling Water Use	
			Withdrawn (MGD)	Consumed (MGD)
1985	16,475,000	73,960	1,353	82
2000	64,529,000	274,110	1,022	343

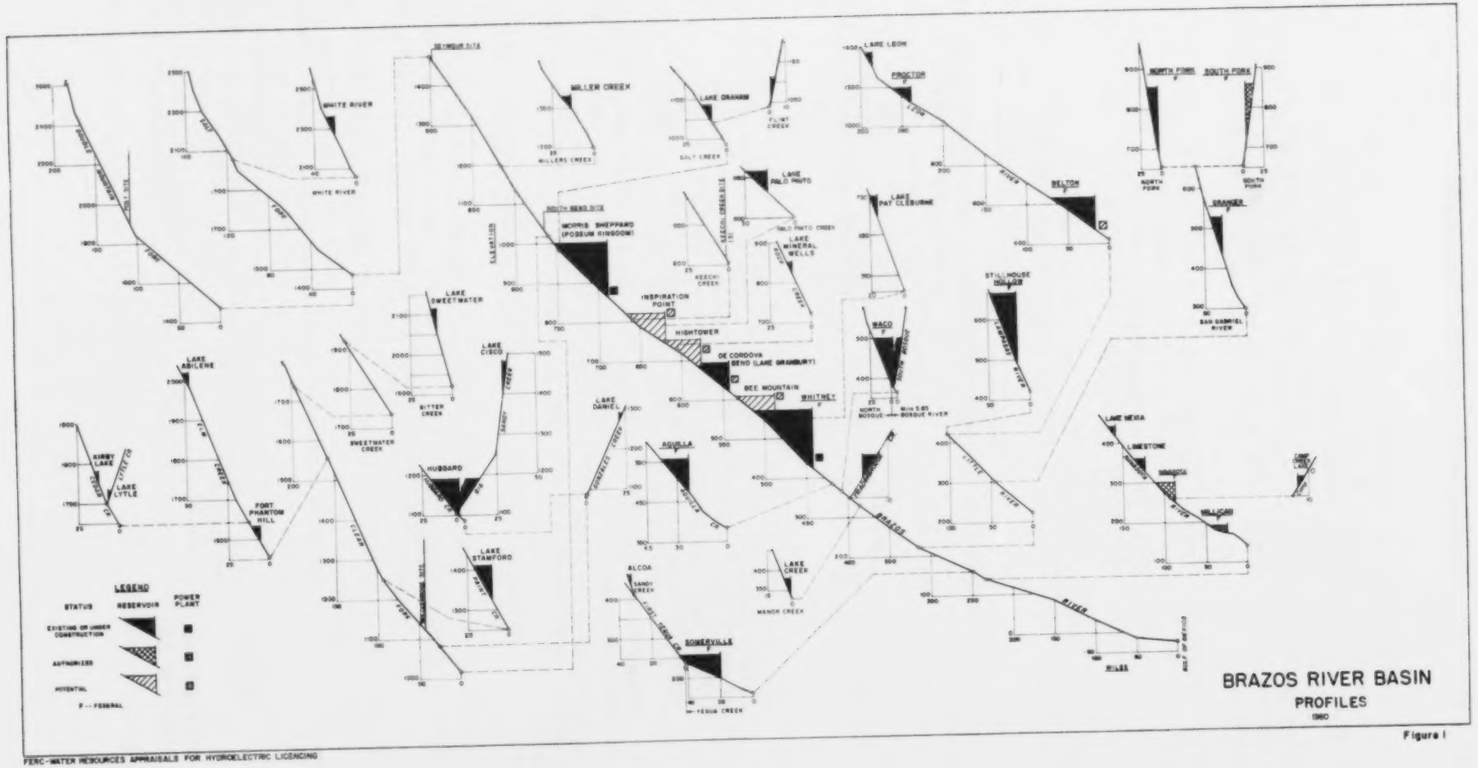
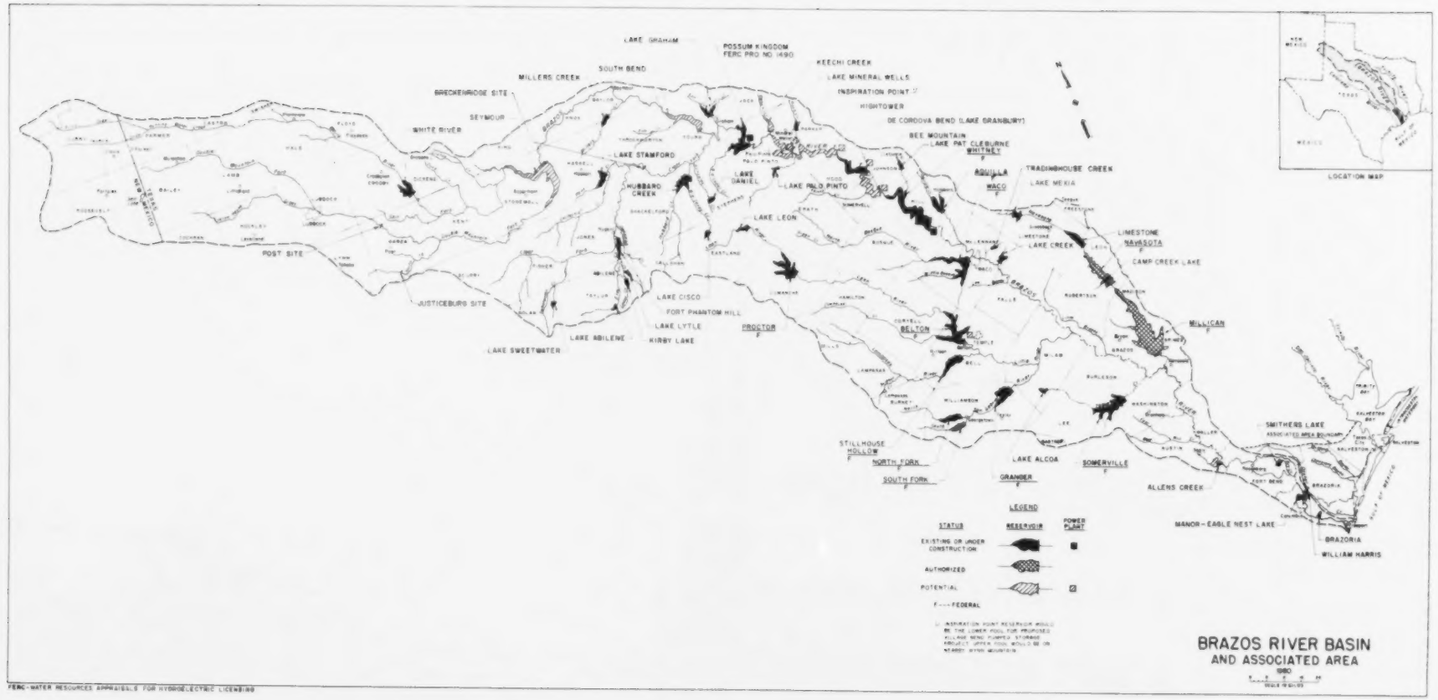


Figure I

FERC-WATER RESOURCES APPRAISALS FOR HYDROELECTRIC LICENCING



FERC-WATER RESOURCES APPRAISALS FOR HYDROELECTRIC LICENSING

Figure 2

Table 6

Potential Steam-Electric Generating Plants with 25 MW or Greater Brazos River Basin and Associated Area - 1985

Plant	Owner 1/	Type Cooling 2/	Installed Capacity (MW)	Generation (GWH)	County	Water Source	Cooling Water Withdrawn (MGD)	Cooling Water Consumed (MGD)
W.A. Parrish	HOLP	CP	3,833	16,790	Fort Bend	Dry Creek	24	17
P.H. Robinson	HOLP	OT	2,315	10,000	Galveston	Dickinson Bay 3/	1,242 3/	8 3/
Abilene	WETU	WT	26	20	Taylor	City Water	0	0
Bryan	BRYN	WT	125	440	Brazos	Wells	2	1
Roland Dansby 4/	BRYN	WT	105	460	Brazos	Wells	2	1
Lake Creek	TEPL	CP	229	1,020	McLennan	Lake Creek	1	1
Lubbock No. 2	LUBB	WT	81	280	Lubbock	City Water	2	1
Paint Creek	WETU	CP	242	740	Haskell	Paint Creek	2	1
Plant X	SOPS	WT	434	880	Lamb	Wells	2	1
Graham	TEES	CP	635	1,950	Young	Salt Creek	3	2
Holly Avenue	LUBB	WT	50	180	Lubbock	City Water	0	0
Tradinghouse Creek	TEPL	CP	1,380	4,910	McLennan	Tradinghouse Creek	7	5
Randle W. Miller	BREP	CP	404	1,460	Palo Pinto	Palo Pinto Creek	3	2
Jones	SOPS	WT	495	990	Lubbock	Sewage	3	2
DeCordova	TEPL	CP	799	3,500	Hood	Brazos River	6	4
Fort Phantom	WETU	CP	364	1,280	Jones	Elm Creek	2	1
Comanche Peak	TUSI	CP	2,300	14,100	Somervell	Squaw Creek	27	18
Allens Creek	HOLP	CP	1,130	6,930	Austin	Allens Creek	14	9
Twin Oak	TEPL	CP	563	2,960	Robertson	Navasota River	4	3
Gibbons Creek	TEPA	CP	400	2,100	Grimes	Gibbons Creek	3	2
Sandow	TEPL	CP	565	2,970	Milam	Sandy Creek	4	3
Totals			16,475	73,960			1,353	82

1/ *HOLP - Houston Lighting & Power Co.; WETU - West Texas Utilities Co.; BRYN - Bryan (Mun.); TEPL - Texas Power & Light Co.; LUBB - Lubbock (Mun.); SOPS - Southwestern Public Service Co.; TEES - Texas Electric Service Co.; BREP - Brazos Electric Power Coop., Inc.; TUSI - Texas Utilities Co. System; TEPA - Texas Municipal Power Agency.*

2/ *CP - Cooling pond; OT - Once-through; WT - Wet tower.*

3/ *Saline water.*

4/ *Referred to alternately as Bryan B.*

U.S. GOVERNMENT PRINTING OFFICE : 1980—329-300/6596